EPA's Review of Revisions to Illinois' Water Quality Standards
Boron Site-Specific Water Quality Standard
For Portion of Sangamon River from Springfield Metro Sanitary District Outfall 007 to 100 Yards Downstream of Confluence with Illinois River
Under Section 303(c) of the Clean Water Act
WQSTS # IL2008-266

Date: OCT 05 2012

I. Summary

A. Date received by EPA: August 9, 2012

B. Submittal History:

On September 9, 2009, the Illinois Environmental Protection Agency (Illinois EPA) submitted a request to the U.S. Environmental Protection Agency for approval of site-specific water quality standards (WQS) for boron for a portion of the Sangamon River from the Springfield Metro Sanitary District's Spring Creek Plant Outfall 007 discharge on the Sangamon River to 100 yards downstream of the confluence with the Illinois River. EPA received a letter from the Illinois Office of the Attorney General on August 9, 2012, certifying that the rulemaking met all federal and state legal requirements. This certification completed the requirements of State WQS submissions as specified in 40 CFR 131.6 and marked the official beginning of EPA's review responsibilities under 40 CFR 131.21 and section 303(c) of the Clean Water Act (CWA).

C. Documents included in the submittal:

- Transmittal letter from Illinois EPA to EPA, dated September 9, 2009;
- Proposed and adopted regulations published in the *Illinois Register* on October 10, 2008 and June 12, 2009;
- The Illinois Pollution Control Board's (IPCB) first notice opinion (September 16, 2008), second notice opinion (April 2, 2009), and adopting opinion (May 21, 2009) in R09-8;
- Public notice for the November 2, 2008 and December 16, 2008 hearings;
- Petition for site-specific regulation;
- Illinois EPA's pre-filed testimony;
- Pre-filed testimony of Springfield's City Water, Light and Power (CWLP) and Springfield Metro Sanitary District (SMSD);
- JCAR's request for analysis of economic and budgetary effects of the rulemaking;
- Transcripts of the November 3, 2008 and December 16, 2008 hearings;
- IPCB's request for economic impact study for the rulemaking;
- Illinois EPA's post-hearing comments;
- CWLP's and SMSD's post-hearing comments;
- CWLP's and SMSD's suggested corrections to the proposed Second Notice language;
- CWLP's and SMSD's post-hearing document submittal; and
- Prairie Rivers Network's comments opposing proposed site-specific boron standard.

D. Other supporting documents:

- Certification statement from Illinois' Office of the Attorney General for site-specific water quality standards for segments of the Sangamon and Illinois rivers, dated August 7, 2012;
- *Facts in Support of Changing Water Quality Standards for Boron, Fluoride, and Manganese* (attachment to "Statement of Reasons", pertaining to proposed revision to statewide boron WQS, filed with IPCB by the Illinois EPA), dated December 1, 2010;
- *Final Report, Acute and Chronic Toxicity of Boron, fluoride, and Manganese to Freshwater Organisms*, dated October 14, 2010;
- *Acute Toxicity Data used in Boron Standard Derivation* (attachment 1 - exhibit G to"Statement of Reasons", pertaining to proposed revision to statewide boron WQS, filed with IPCB by the Illinois EPA), dated December 1, 2010;
- *Chronic Toxicity in Boron Standard Derivation* (attachment 1 - exhibit H to"Statement of Reasons", pertaining to proposed revision to statewide boron WQS, filed with IPCB by the Illinois EPA), dated December 1, 2010;
- *Boron Standard Derivation Using 1985 Guidelines Methodology* (attachment 1 - exhibit I to"Statement of Reasons", pertaining to proposed revision to statewide boron WQS, filed with IPCB by the Illinois EPA), dated December 1, 2010;
- Testimony of Brian Koch, Illinois EPA, before the IPCB in the matter of the triennial review of water quality standards for boron, fluoride and manganese, filed May 20, 2011.

E. Description of Action:

Illinois EPA proposes to establish three site-specific boron WQS for a stretch of the Sangamon and Illinois Rivers downstream from the SMSD Spring Creek Plant Outfall 007. Illinois' general use water quality standard for boron is currently 1.0 mg/L.[1] The WQS for boron would be changed to 4.5 mg/L, 1.6 mg/L and 1.3 mg/L for different segments of the Sangamon and Illinois rivers covering an approximate distance of 75 miles.

At the request of Springfield's CWLP and SMSD, the IPCB adopted site-specific boron WQS as listed above, at 35 Ill. Adm. Code 303.446, to allow the SMSD's Spring Creek Plant to accept pretreated industrial effluent from Springfield's city-run electric power plant. That power plant's air emissions wastewater from coal combustion contains a high level of boron that exceeds the dilution capacity of the SMSD Spring Creek Plant to meet the water quality standard. Illinois EPA determined the site-specific WQS were necessary to allow CWLP to dispose of air emissions waste, from a new coal fired power plant, to the Spring Creek sewage treatment plant.

F. Basis of Action:

The IPCB concluded that the treatment plant and the water body segments met the requirements for site-specific boron WQS, set forth in Section 27 of the Illinois Environmental Protection Act,

[1] The Illinois Pollution Control Board recently published a proposed rule revision for the general use boron WQS [40,100 µg/l (acute) and 7,600 µg/L (chronic)]. The revised WQS had not yet been submitted to EPA for approval at the time this document was prepared.

415 ILCS 5/27 (2010), and in accordance with Illinois Administrative Procedure Act, 5 ILCS 100/5-5 (2010).

Illinois EPA determined that an adjustment of the WQS was warranted given that the affected stretch of river is not used for public water supply or crop irrigation and available information indicates boron is not toxic to aquatic life at the proposed site-specific concentrations. Illinois EPA has stated that the nearest public water supply intake is approximately 185 miles downstream of the SMSD discharge from the Spring Creek Plant and that it was not aware of any significant use of the Sangamon River for crop irrigation which was the primary use the initially adopted general use boron WQS of 1 mg/L was intended to protect (IPCB 2008c).

II. Areas Affected and Environmental Impacts

A. Area Affected:

The SMSD discharges into the Sangamon River from Outfall 007 of the Spring Creek Plant. The site-specific WQS will extend for approximately 75 miles, starting from the edge of the mixing zone for Outfall #7 and ending at the point about 100 yards downstream of the confluence of the Sangamon and Illinois Rivers where the current statewide general use WQS will be met. The area affected is limited to the river channel and adjoining flood plain areas that may occasionally be inundated by high water levels in the Sangamon River.

B. Environmental Impacts:

1. Aquatic Life

Information and data was presented to the IPCB to demonstrate that the current elevated boron levels in the Sangamon River have not adversely impacted the aquatic life community. The technical support document provided by Illinois Springfield's CWLP and SMSD concluded that, with boron concentration ranging from 0.029 mg/L to 2.14. mg/L in the Sangamon River, macroinvertebrate surveys in 1996 and 2003 showed the lower Sangamon River stream segments to be fully supporting aquatic life (Hanson 2008, p. 5-14). In addition the report found "results of the fisheries surveys conducted in 1996 and 2003 also do not reflect adverse effects from current born levels in the Sangamon River" (Hanson 2008, p. 5-14). Illinois EPA agreed with the conclusion that the boron concentrations proposed for discharge "will not cause aquatic life toxicity in the Sangamon River" (IBPB 2008c, p. 4).

Illinois EPA has recently developed new statewide general use boron water quality standards that the IPCB published as proposed rules on April 13, 2012 (IPCB 2012). The most recent data available on effects from acute and chronic exposure of aquatic organisms to boron were used by Illinois to develop the new acute and chronic boron standards that will be protective of aquatic life. Additional toxicity testing was performed (Soucek and Dickinson 2010) to supplement the data available from a review of the literature.

Using EPA's 1985 Guidelines, Illinois determined acute and chronic standards for boron of 40.1 mg/L and 7.6 mg/L, respectively, would be protective of aquatic life (IPCB 2010d). A total of

17 genus mean acute values (MAVs) were used to compute the acute standard of 40.1 mg/L. The lowest MAV was 84.8 mg/L which was for *Ceriodaphnia* (IPCB 2010b). For the chronic standard derivation, ACRs were generated from representative species (*Daphnia magna, Pimephales promelas, and Hyalella azteca*) from three families (IPCB 2010c). In addition to *H. azteca* providing a third family representative for the chronic standard derivation, *H. azteca* was included because it is a native species which Illinois considers "an important component of the state's stream ecosystems and a pollutant sensitive species" (IPCB 2010a, p 14).

Since the current general use boron WQS of 1 mg/L was based primarily on sensitivity of irrigated crops (IPCB 2008c), Illinois reviewed the literature for data on toxicity to aquatic plants (IPCB 2010c). Illinois determined that none of the plant data could be included in the WQS derivation because of unsuitable test methods, endpoints or test conditions. Therefore, no plant data was used in to determine the new general use acute or chronic boron WQS that were recently published as proposed rules.

Although the revised WQS identified above have not yet been submitted to or approved EPA, the data that was used in the WQS derivation represents the best available science and indicates that the site-specific WQS ranging from 4.5 to 1.3 mg/L for segments of the Sangamon and Illinois Rivers would be protective of the aquatic life.

2. Human Health

The site-specific WQS will have no effect on human health. The nearest public water supply intake is approximately 110 miles downstream from the area covered by the site-specific WQS.

III. CWA Sections 101(a)(2)/303(c)(2)/118(c)(2)/40 CFR 131 and 132 Review

A. EPA's authority under section 303(c)(2) of the CWA

Water quality standards requirements of CWA Sections 101(a)(2) and 303(c)(2) are implemented through federal regulations contained in 40 CFR 131; water quality standards requirements of CWA Section 118, specific to waters of the Great Lakes System, are implemented through federal regulations contained in 40 CFR 132. Federal regulations at 40 CFR 131.21 require EPA to review and approve or disapprove state-adopted water quality standards. In making this determination, EPA must consider the following requirements of 40 CFR 131.5:

- whether state-adopted uses are consistent with CWA requirements;
- whether the state has adopted criteria protective of the designated uses;
- whether the state has followed legal procedures for revising its standards;
- whether state standards are based on appropriate technical and scientific data and analyses; and
- whether the state's submission includes certain basic elements as specified in 40 CFR 131.6.

Section 101(a)(2) of the CWA specifies that designated uses "provide for the protection and propagation of fish, shellfish, and wildlife and provide for recreation in and on the water."

Section 303(c)(2) of the CWA requires that standards shall protect the public health and shall take into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational, agricultural, industrial, and navigational purposes

EPA is required to review and approve new and revised water quality standards submitted by states and tribes. The following actions are possible:

- **Approval**. Where EPA has concluded that the new or revised water quality standards are consistent with the CWA and federal regulations and that they will have no affect on listed species, or are otherwise not subject to ESA consultation.
- **Approval subject to ESA consultation.** Where EPA has concluded that the new or revised water quality standards are consistent with the CWA and federal regulations and that they may affect listed species (including beneficial effects), but that consultation is not concluded.
- **Disapproval**. Where EPA has concluded that the new or revised water quality standards are not consistent the CWA or federal regulations.
- **No EPA action**. Where EPA has concluded that certain new or revised water quality standards are not revisions to the state's or tribe's water quality standards and, therefore, are not required to be reviewed under Section 303(c) of the CWA.

Consistent with federal regulations at 40 CFR 131.21, new or revised water quality standards do not become effective for CWA purposes until they are approved by EPA.

B. Public Participation, Comments, and Issues Raised regarding the Illinois Pollution Control Board's Proposed Site-specific Boron Water Quality Standard for Portions of the Sangamon and Illinois Rivers

A proposal for a rulemaking was first filed with the IPCB on August 29, 2008 by the City of Springfield, Office of Public Utilities (City Water, Light and Power) and Springfield Metro Sanitary District (collectively identified below as the petitioners) to establish site-specific boron WQS for segments to the Sangamon and Illinois Rivers (IPCB 2008).

On September 16, 2008, the IPCB accepted the proposal for hearing, granted a motion to waive the requirement for 200 signatures, granted a motion for expedited consideration and directed publication of first-notice of the proposal without comment on the merits of the proposal.

Pre-filed testimonies were filed with the IPCB on October 20, 2008 (IPCB 2008b) and October 27, 2008 (IPCB 2008c) for the hearing held on November 3, 2008.

- Seven individuals (D. Farris, G. Finigan, and D. Brown from CWLP; D. Schilling from Burns & McDonnell; W. Brown from Crawford Murphy & Tilly, Inc.; and D. Ramsey and J. Busher from Hanson Professional Services, Inc.) testified in support of the proposed site-specific WQS.
- Illinois EPA, represented by Robert Mosher, testified that the site-specific rule-making was necessary because the "boron cannot be removed without significant monetary and energy expenditures that are not technically feasible or economically reasonable" (IPCB 2008c).

The IPCB held a second hearing on December 16, 2008 at which the petitioners' witnesses provided answers to new questions raised by Prairie Rivers Network. Then January 29, 2009, Prairie Rivers Network submitted comments to the IPCB opposing the proposed site-specific boron WQS.

- Prairie Rivers opposed the site-specific boron WQS for the following reasons (as summarized by the IPCB):

    - failure to demonstrate that treatment to remove boron to meet the general use standard is technically infeasible;
    - failure to show that treatment to remove boron to meet the general use standard is economically unreasonable;
    - failure to provide an accurate assessment of the environmental impacts of the proposed site-specific boron standard; and
    - the site-specific WQS would not protect existing uses.

In response to concerns raised by Prairie Rivers, the IPCB determined that:

- CWLP evaluated alternatives and "committed substantial finances and resources to investigating the brine concentrator option. Only after struggling with the nuances of the system and projecting costs surpassing $40 million did CWLP abandon the project to evaluate other options. The Board finds that the poor experience with the pilot plant coupled with the lack of similar systems treating boron with concentrations in the 400-500 mg/L range supports Springfield's assertion that this option is neither technically feasible nor economically reasonable." (IPCB 2009, p 25);
- the petitioner provided cost estimates that support the alternative of pumping the CWLP's flue gas desulfurization system wastewater to the Spring Creek treatment plant as being economically reasonable ((IPCB 2009, p 26);
- both the petitioner and Illinois EPA provided testimony on the impacts of boron to aquatic life in the streams (IPCB 2009 p 27); and
- considering the record provided on the toxicological impact of boron on the streams at the concentrations proposed for the site-specific WQS, the uses of the streams would be protected (IPCB 2009, p 27);

EPA did not review a draft version of this site-specific water quality standard.

C. EPA's Review of Illinois EPA's Final Rules

1. Review of Submittal for Completeness

Regulatory Requirement:	**Illinois EPA's Site-Specific Boron WQS Rule Submittal:**
Use designations consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act **(40 CFR 131.6(a))**	The designated use for the segments of the Sangamon River and Illinois River is general use. The subject segments are not public water supplies.
Methods used and analyses conducted to support WQS revisions **(40 CFR 131.6(b))**	Illinois EPA submitted testimony to the IPCB, scientific studies, toxicological data and rationale as described above.
Water quality criteria sufficient to protect the designated uses of Illinois surface waters **(40 CFR 131.6(c))**	The site-specific boron WQS are 4.5 mg/L starting at the edge of the mixing zone from the Spring Creek treatment plant outfall #7 in the Sangamon River and extending for 39 miles downstream; then 1.6 mg/L extending for 36.1 miles to the confluence of the Sangamon with the Illinois River; and then 1.3 mg/L in the Illinois River for a distance of 100 yards downstream from the confluence with the Sangamon River.
An antidegradation policy consistent with §131.12 **(40 CFR 131.6(d))**	Not applicable. This site-specific WQS does not affect Illinois' existing antidegradation policy.
Certification by the State Attorney General or other appropriate legal authority within the State that the WQS were duly adopted pursuant to State law. **(40 CFR 131.6(e))**	The Illinois Office of the Attorney General certified the site-specific boron WQS for segments of the Sangamon and Illinois Rivers in a letter from Matthew J. Dunn to Linda Holst, dated August 7, 2012.
General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which may affect their application and implementation. **(40 CFR 131.6(f))**	The information submitted by Illinois EPA and the petitioner is described above.

2. EPA action on the final rule submitted by Illinois EPA:

a. Description of new rule:

The site-specific boron WQS for segments of the Sangamon and Illinois Rivers are found at 35 Ill. Adm. Code 303.446.

Section 303.446 Boron Water Quality Standard for Segments of the Sangamon River and the Illinois River

The general use water quality standard for boron set forth in 35 Ill. Adm. Code 302.208(g) shall not apply to segments of the Sangamon River and the Illinois River (described below) that receive discharge from Outfall 007 of the Spring Creek Sewage Treatment Plant located at 3017 North 8th Street, Springfield, Illinois, owned by the Springfield Metro Sanitary District. Boron levels in those river segments must meet the following water quality standards for boron:

a) 11.0 mg/L in the Sangamon River from Outfall 007 (Latitude: 39° 51' 37.234" North, Longitude: 89° 38' 30.082" West) to 182 yards downstream from the confluence of Spring Creek with the Sangamon River (Latitude: 39° 51' 42.595" North, Longitude: 89° 38' 30.089" West);
b) 4.5 mg/L in the Sangamon River from 182 yards downstream of the confluence of Spring Creek with the Sangamon River (Latitude: 39° 51' 42.595" North, Longitude: 89° 38' 30.089" West) to the confluence of Salt Creek with the Sangamon River (Latitude: 40° 7' 33.009" North, Longitude: 89° 49' 40.224" West), a distance of 39.0 river miles;
c) 1.6 mg/L in the Sangamon River from the confluence of Salt Creek with the Sangamon River (Latitude: 40° 7' 33.009" North, Longitude: 89° 49' 40.224" West) to the confluence of the Sangamon River with the Illinois River (Latitude: 40° 1' 20.995" North, Longitude: 90° 25' 59.451" West), a distance of 36.1 river miles; and
d) 1.3 mg/L in the Illinois River from the confluence of the Illinois River with the Sangamon River (Latitude: 40° 1' 20.995" North, Longitude: 90° 25' 59.451" West) to 100 yards downstream of the confluence of the Illinois River with the Sangamon River (Latitude: 40° 1' 20.197" North, Longitude: 90° 26' 3.205" West).

(Source: Added at 33 Ill. Reg. 7903, effective May 29, 2009.)"

b. EPA conclusion:

The first segment the Sangamon River with a site-specific WQS of 11 mg/L is actually the mixing zone allowed as identified in 35 Ill. Adm. Code 302.102. The mixing regulations allow 50 percent of the 7Q10 flow to be used for mixing if the dilution ration is less than 3 to 1. The 11 mg/L was based on the current general use standard of 1 mg/L for boron.[2] Since the mixing zone is not considered a water quality standard, EPA is not taking any action on Illinois' site-specific standard of 11 mg/L for the first segment/mixing zone.

Illinois EPA followed EPA guidance (EPA 1985) to derive acute and chronic boron WQS which were recently published as proposed rules by the IPCB on April 13, 2012. Based on the latest toxicological data and calculations provided by Illinois EPA in developing their new general use acute and chronic boron standards mentioned previously, EPA believes the site-specific WQS (4.5 mg/L and 1.6 mg/L in segments of the Sangamon River running from 182 yards downstream

[2] Illinois EPA provided supplemental information (IEPA 2012) that shows by using the newly develop chronic standard of 7.6 mg/L the effluent limit that would allow the WQS to be met after mixing would be 15.2 mg/L instead of 11 mg/L.

from the confluence of Spring Creek with the Sangamon to the confluence of the Sangamon with the Illinois River, and 1.3 mg/L from the confluence of the Sangamon and the Illinois River to 100 yards downstream of that confluence) should be protective of the aquatic life.

EPA Action: EPA approves the site-specific boron WQS extending from the mixing zone of the Spring Creek Plant in the Sangamon River to 100 yards downstream of the confluence of the Sangamon and Illinois Rivers.

IV. Endangered Species Act (ESA) Requirements

As required under section 7 of the ESA and federal regulations at 50 CRF Part 402, EPA is required to consult with the U.S. Fish and Wildlife Service (FWS) on any action taken by EPA that may affect federally-listed threatened or endangered species or their critical habitat. Actions are considered to have the potential to affect listed species if listed species are present in the action area. The action area for the site-specific boron WQS in the Sangamon and Illinois Rivers is the approximately 75 miles of river, starting from the edge of the mixing zone for Outfall 007 of the Spring Creek Plant and ending at the point about 100 yards downstream of the confluence of the Sangamon and Illinois Rivers where the current statewide general use WQS will be met.

EPA checked the USFWS-Midwest Region's Section 7 Consultation website (www.fws.gov/midwest/endangered/section7/s7process/index.html) and determined the only federally listed species in Brown, Cass, Mason, Menard, Sangamon and Schuyler counties (which the Sangamon River borders or flows through) are: Indiana bat (*Myotis sodalis*), Decurrent false aster (*Boltonia decurrens*), Eastern prairie fringed orchid (*Platanthera leucophaea*), and Prairie bush clover (*Lespedeza leptostachya*). Prairie bush clover was not evaluated because it is found in dry to mesic prairies and thus not aquatic dependent.

Eastern prairie fringed orchid

The Eastern prairie fringed orchid was evaluated since it is an aquatic dependent species. Previous communication with the FWS field office (phone conversation with Joel Trick, January 2010) provided information that indicated the orchid would be found in wet meadow habitat and not in wetland areas that would be inundated (such as by the Sangamon River). Therefore the Eastern prairie fringed orchid would not be located within the action area and thus the site-specific boron WQS will have no effect on the orchid.

Indiana bat

The Indiana bat could possibly occur along the forested riparian corridor along the Sangamon River downstream from the Spring Creek wastewater treatment plant (FWS 2012b). Any Indiana bats that might reside within the action area along the Sangamon River would likely consume available adult aquatic insects. Indiana bats are considered opportunistic foragers of both terrestrial and adult aquatic insects depending upon availability. Although only a portion of the Indiana bat's diet would be comprised of aquatic insects, if this food supply were affected by the higher chloride concentration allowed by the variance it could affect the Indiana bat species. However, because Indiana bats are opportunistic foragers and the availability of terrestrial

insects as a food source would not be impacted by the site-specific boron WQS, EPA concluded that although the approval of the chloride variance-based effluent limit may affect the Indiana bat, it is not likely to adversely affect the species.

Decurrent false aster

The decurrent false aster is endemic to the Illinois River floodplain. The plant is an early successional plant that benefits from physical disturbance of its habitat such as by periodic flooding that kills or scours away competitor species thus exposing the area to more sunlight. There is no specific information on affects of boron to species such as the decurrent false aster but boron is known to be harmful to some plants. The current 1.0 mg/L statewide general use water quality standard for boron was established to protect irrigated crops.

If decurrent false aster plants do occur along the Sangamon River or in the first 100 yards downstream of the confluence of the Sangamon with the Illinois River, the plants would be in the flood plain and not the river channel. Any direct exposure to the river water would only be under flood conditions when the concentration of boron would be expected to be considerably lower than the level calculated for the site-specific WQS which are determined based on wastewater plant discharge to the river during very low flow conditions. Therefore, EPA concludes that any exposure of the decurrent false aster to boron would be minimal and of brief duration and, furthermore, although the boron site-specific WQS for segments of the Sangamon and Illinois Rivers may affect the decurrent false aster, they are not likely to adversely affect the species.

EPA has initiated but not concluded consultation with the FWS in order to obtain concurrence with this decision.

V. Tribal Consultation Requirements

On May 4, 2011, EPA issued the "EPA Policy on Consultation and Coordination with Indian Tribes" to address Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments." The EPA Tribal Consultation Policy states that "EPA's policy is to consult on a government-to-government basis with federally recognized tribes when EPA actions and decisions may affect tribal interests."

There are no federally recognized tribes located in the vicinity of Springfield's discharge. Therefore, tribal consultation is not required for this site-specific boron WQS.

VI. Documents Considered by EPA

Hansen. 2008. Technical Support Document for Site-Specific Boron Standard for Springfield. (included as attachment to IPCB filing on August 29, 2008) August 13, 2008.

FWS. 2012a. Illinois County Distribution – Federally Endangered, Threatened, and Candidate Species. http://www.fws.gov/midwest/endangered/lists/illinois-cty.html .

FWS. 2012b. Indiana Bat (*Myotis sodalis*) fact sheet. (fact sheet revised December 2006). www.fws.gov/midwest/endangered/mammals/inba/pdf/inbafctsht.pdf .

FWS. 2012c. Decurrent false aster (*Boltonia decurrens*) fact sheet (fact sheet last updated March 6, 2012) http://www.fws.gov/midwest/endangered/plants/decurrfa.html .

IEPA. 2012. Springfield Spring Creek STP Boron Analysis.docx – provided by Bob Mosher via email to Barbara Mazur on 9/25/2012.

IPCB. 2008a. Notice of Filing with Petition for Site Specific Rule, submitted by City of Springfield, Illinois, Office of Public Utilities, City Water, Light and Power, and Springfield Metro Sanitary District. August 29, 2008.

IPCB. 2008b. Pre-filed testimonies in support of proposed site specific rule: D. Farris, G. Finigan, D. Brown, D. Schilling, Wm Brown, D. Ramsey, J. Bushur (R09-8). October 20, 2008.

IPCB. 2008c. Pre-filed testimony of Robert Mosher (PCB No. 2009-0008). October 27, 2008.

IPCB. 2010a. Attachment 1: *Facts in Support of Changing Water Quality Standards for Boron, Fluoride, and Manganese*. Attachment to Statement of Reasons filed with the Illinois Pollution Control Board by the Illinois Environmental Protection Agency. December 1, 2010.

IPCB. 2010b. Attachment 1-Exhibit G: *Acute Toxicity Data Used in Boron Standard Derivation*. Attachment to Statement of Reasons filed with the Illinois Pollution Control Board by the Illinois Environmental Protection Agency. December 1, 2010.

IPCB. 2010c. Attachment 1-Exhibit H: *Chronic Toxicity in Boron Standard Derivation.* Attachment to Statement of Reasons filed with the Illinois Pollution Control Board by the Illinois Environmental Protection Agency. December 1, 2010.

IPCB. 2010d. Attachment 1-Exhibit I: *Boron Standard Derivation Using 1985 Guidelines Methodology*. Attachment to Statement of Reasons filed with the Illinois Pollution Control Board by the Illinois Environmental Protection Agency. December 1, 2010.

IPCB. 2011. Pre-filed testimony of Brian Koch (R11-18). May 20, 2011.

IPCB. 2012. Proposed Rule – First Notice (R11-18): Triennial Review of Water Quality Standards for Boron, Fluoride and Manganese. Illinois Pollution Control Board. March 15, 2012.

Soucek, D.J. and A. Dickinson. 2010. Acute and Chronic Toxicity of Boron, Fluoride, and Manganese to Freshwater Organisms. Final Report. Illinois Natural History Survey, University of Illinois, Urbana-Champaign, Champaign, IL. October 14, 2010.

U.S. Environmental Protection Agency. 1985. Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses. Office of Research and Development, U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2002. Memorandum of Agreement Between the Environmental Protection Agency, Fish and Wildlife Service and National Marine Fisheries Service Regarding Enhanced Coordination Under the Clean Water Act and Endangered Species Act (66 FR 11202; February 22, 2001). Report No. EPA-823-R-02-003. Office of Water. 24 pp.